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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,071	12/20/2001	Joseph R. Ward	D5216	9833

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EXAMINER

KERNS, KEVIN P

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 10/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/027,071	WARD, JOSEPH R.	
	Examiner	Art Unit	
	Kevin P. Kerns	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 9-14 is/are pending in the application.
- 4a) Of the above claim(s) 6-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 9-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-14 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. This application contains claims 6-8 drawn to an invention non-elected with traverse. The applicant is referred to paragraph 1 of the prior Office Action, regarding the choice of consecutive and simultaneous steps, as well as resulting elemental composition of the substantially similar gray cast iron product to be cast. In addition, as set forth in the election/restriction Office Action, an additional search burden would be placed on the examiner (class 164 method and class 123 product). Regarding the applicant's arguments, the examiner is not required to show "facts" or "evidence" in a restriction requirement, since only proper distinction of the inventions is required. Since the product having the specified ranges of elemental compositions can be made with either a single addition step or two addition steps, a proper restriction has been established. The requirement is still deemed proper and is therefore made FINAL. A complete reply to the final rejection must include cancellation of non-elected claims or other appropriate action (37 CFR 1.144). See MPEP § 821.01.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-5 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tache (US 3,299,482) in view of Bostater et al. (US 4,493,359).

Tache discloses a gray iron casting process and composition for making engine component parts by adding a tin alloying element, in which the composition includes (by weight percent): 3.05 to 3.45% carbon (carbon equivalent between 3.76 and 4.15%), 1.7 to 2.1% silicon, maximum 0.15% phosphorus, maximum 0.12% sulfur, 0.5 to 0.9% manganese, maximum 0.15% chromium, 0.05 to 0.08% tin, and balance iron (column 1, lines 11-16; column 3, lines 1-56 and 70-76; and column 4, lines 1-46). Preferably, the tin is added to the molten gray iron in the cupola during filling of the pouring ladles by addition of preweighed chunks of metallic tin in the range of 0.05 to 0.08% by weight, resulting in a molten alloy of tin with gray iron, followed by subsequent (as soon as possible) casting into mold(s) to produce the engine components (column 3, line 75; and column 4, lines 1-46). After the molten gray iron composition is poured into molds while the molten metal is at about 2550 to 2650 degrees F, the resulting casting is cooled and taken to core knockout and shakeout stations while the bores are still at temperatures of about 1450-1500 degrees F (column 1, lines 55-70). Although Tache

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discloses a composition that includes silicon within the gray iron alloy, Tache does not disclose the step of adding further silicon as an inoculant to the molten gray iron alloy.

However, Bostater et al. disclose a method for making cast iron engine blocks from a casting process with molten gray iron, in which a silicon-containing inoculant (foundry grade ferrosilicon containing 23% iron and 7.5% silicon, ranging from 100 to 300 ounces of inoculant per 1,600 pounds of molten metal) is added to a molten gray iron composition (that already contains silicon) and stirred within a casting ladle for subsequent pouring into casting molds (abstract; column 1, lines 6-13; column 3, lines 3-21 and 52-68; column 4, lines 1-3 and 50-60; column 5, lines 54-68; column 6, lines 1-15; column 7, lines 4-26; and Figure). A sample of molten metal in the holding furnace was taken periodically for thermal analysis to obtain control of the carbon equivalent value (at a desired level of about 4%) within the molten gray iron (column 5, lines 42-53; and Figure). Castings of various cross-sections, including those that have very thin walls which would otherwise have high casting scrap losses, are able to be produced due to the molten metal homogeneity and addition of silicon-containing inoculant, with the advantageous feature of achieving a low casting scrap rate of less than 5% (column 2, lines 21-45; column 3, lines 3-21 and 33-40; column 4, lines 44-65; column 5, lines 54-68; column 6, lines 1-15; and column 7, lines 23-39). The additional step of adding a silicon-containing inoculant is advantageous for producing gray iron castings of various cross-sections with a substantial increase in the uniformity of molten metal as poured (column 4, lines 44-49; column 5, lines 57-68; column 6, lines 1-15; and column 7, lines 23-40).

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It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the gray iron casting process and composition for making engine component parts by adding a tin alloying element, as disclosed by Tache, by using the additional step of adding and stirring a silicon-containing inoculant to a molten gray iron composition that already includes silicon, as taught by Bostater et al., in order to produce gray iron castings of various cross-sections with a substantial increase in the uniformity of molten metal as poured (Bostater et al.; column 4, lines 44-49; column 5, lines 57-68; column 6, lines 1-15; and column 7, lines 23-40).

Response to Arguments

5. The examiner acknowledges the applicant's amendment received by the USPTO by facsimile on August 14, 2003. The applicant continues to traverse the restriction requirement, and the examiner continues to disagree, as discussed in paragraph 1 above and in the prior Office Action (paper #6) of May 21, 2003. The applicant's amendment overcomes the prior claim objections and rejections under 35 USC 112, 2nd paragraph. The examiner also acknowledges the inventor's declaration under 37 CFR 1.132 in the amendment of August 14, 2003. Claims 6-8 are drawn to a non-elected invention and remain withdrawn from consideration. New claim 14 has been added, such that claims 1-5 and 9-14 are now under consideration in the application.

6. Applicant's arguments filed August 14, 2003 have been fully considered but they are not persuasive.

With regard to the applicant's arguments on pages 7-12 of the amendment, as well as the declaration under 37 USC 1.132, the examiner has considered the major issues as follows:

1) regarding the disclosure of Tache, as discussed by the applicant on pages 7-9, the examiner respectfully disagrees with the applicant's assertion that some of the ranges of elemental compositions (within the gray iron casting composition) cited in Tache do not correspond to the applicant's compositions. In fact, the examiner cannot find a single element in the overall composition that does not fall within the ranges required by applicants. Moreover, for any of Tache's elemental compositions that cite a "maximum" value, a minimum of 0% (inclusive of phosphorus, sulfur, and chromium, as the applicant argues near the bottom of page 7) also reads on the applicant's claims in the broadest reasonable interpretation. The amount of tin (0.05 to 0.08%) added to the gray iron composition is also disclosed in Tache, substantially overlapping with the applicant's tin range of (0.05 to 0.10%).

The exact amounts of each of the constituents as presently claimed are not disclosed in the prior art; however, the prior art compositions closely approximate or overlap applicant's claimed composition. It has been held that one of ordinary skill in the art at the time of the invention would have considered the claimed compositions to have been obvious because overlapping ranges in a composition is considered to establish a prima facie case of obviousness. See In re Malagari 182 USPQ 549, Titanium Metals v. Banner 227 USPQ 773, In re Nehrenberg 126 USPQ 383.;

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2) on pages 8 and 9, the applicant (in both the amendment and declaration) has argued that the term "as soon as possible" is a significant feature in the claims.

However, Tache would also be concerned with casting production time, and his operation is limited by cooling time of the cast product, as the gray iron composition must cool over 1000 degrees F before core knockout/shakeout (see new underlined portion of paragraph 4 above, which sets forth the response to new limitations in claims 1 and 14 of the applicant's amendment). In the casting operation, Tache would fill the mold at about 2600 F and cool the casting until the core temperature is at about 1500 F. In casting operations, the term "as soon as possible" is not only applicable to time, but also to temperature. Cooling the casting to a temperature of, for example, 1600 or 1800 degrees F could also be considered "as soon as possible", but optimum casting results may not be achieved. The same could be said over a wide range of temperatures spanning hundreds of degrees F. Therefore, casting results obtained by Tache is constrained by both time and temperature factors, and this is true in a plethora of casting operations in view of one of ordinary skill in the casting art; and

3) on pages 10-12, the applicant has argued that the disclosure of Bostater et al. does not provide a proper obviousness-type combination with Tache under 35 USC 103(a), even though Tache lacks only the silicon addition to the tin-alloyed gray iron metal. The examiner respectfully disagrees, as Bostater et al. disclose that ferrosilicon is added as the form of silicon (within the span of ranges) to gray iron, and the applicant also states that silicon is a common foundry inoculant in his declaration on paragraph 5, as well as the amendment near the bottom of page 10. The applicant also argues (on

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pages 11 and 12) that the individual elemental compositions of Bostater et al. vary substantially from that of Tache and the applicant. Although some elements within the composition fall somewhat outside of the ranges of the applicant and Tache, the significant step of adding silicon to a gray iron composition already containing silicon is clearly set forth by Bostater et al., for the purpose of producing gray iron castings of various cross-sections with a substantial increase in the uniformity of molten metal as poured (see paragraph 4 above).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (703)

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305-3472. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

KPK

kpk

October 6, 2003


ALEXANDRA ELVE
PRIMARY EXAMINER